In addition, it is important to note the inherent cost differences associated with serving local voice customers and serving high-volume inbound customers like ISPs. CLECs can serve ISPs at very little cost because the companies can configure their networks to minimize the cost of transport and delivery of the ISP's incoming traffic (i.e., place switches in close proximity to the ISP or even permit the ISPs to collocate their equipment at the CLEC's premises). Additionally, the CLEC serving ISP clients does not need to support many, if not all, of the features of an advanced intelligent network, such as call-waiting, three-way calling, or local number portability, as these are features that are not required for an ISP call.

As an economic matter, therefore, Focal witness Starkey is wrong when he denies that CLECs such as Focal that are either ISPs, or whose traffic is predominantly ISP traffic, are likely to have an inherently far lower cost structure than that of the corresponding ILEC.[47] First, if Focal's costs were truly higher than those of Ameritech, one would expect that Focal would have volunteered a properly constructed cost study to support this assertion. Second, if Focal were not cost competitive with respect to Ameritech, it ought to modify its business strategy. In fact, when selling its shares to the investing public, Focal management claimed that "we believe we can produce a positive return on capital despite a substantial reduction in reciprocal compensation revenue resulting from lower rates for reciprocal compensation."[48] Third, Starkey's assertions fly in the face of reports in industry journals. For example, a leading integrated carrier such as Level Three Communications, one of Focal's suppliers[49] and who provides a "managed

[47] See Starkey Verified Statement at p. 47.
[48] See Focal Inc, Form S-1 (Initial Public Offering - Registration of Securities & Investment Prospectus), filed with the Securities & Exchange Commission, May 7, 1999, at p.20.
[49] See Focal, Inc. Form 10-Q for the 3rd quarter of 1999, filed with the Securities & Exchange Commission, November 12, 1999.

modem" service to large ISPs such as America Online, has publicly stated that it can engineer the "managed modem" switches to "reap capital savings between 40 percent and 60 percent, and operational savings that 'may be even greater.'"[50]

When we consider the magnitude of these savings by CLECs when handling ISP traffic, it is plain that applying an interconnection rate that was designed for local voice traffic to ISP traffic would lead to substantial cost over-recovery. Indeed, in Focal's most recent quarterly report, the company stated that approximately 70% of its installed lines serve ISPs.[51] In the same quarterly report, Focal stated:

> Reciprocal compensation is currently a significant component of our total revenues representing approximately 75%, 60%, and 53% of our total revenues for 1998 and the nine and three month periods ended September 30, 1999, respectively. On July 1, 1999, we began to exclude certain reciprocal compensation revenues generated from our operations in a number of states where recent regulatory developments have influenced the potential collection of reciprocal compensation receivables in those states.[52]

Focal's own data clearly illustrates that there is nothing reciprocal about the compensation that Focal is seeking. Reciprocal compensation is designed to compensate traffic imbalances when traffic is exchanged both ways between two local exchange carriers. By its own admission, Focal has deliberately pursued a business strategy such that it almost exclusively delivers traffic originating on the Ameritech network, and sends little if any traffic the other way. It is therefore clear that Focal is seeking to continue to exploit a profitable loophole, by collecting reciprocal compensation at a high rate for traffic that is one-way and that can be delivered relatively cheaply.

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50 See Peter Lambert and Paula Bernier, "Level 3 Goes Soft—Lucent Softswitch Investment Expected to Yield Huge Saving", *X-CHANGE*, August 1999, at ¶ 8. Available online at (http://www.x-changemag.com/articles/981spot.html).

51 See Focal Communications Corp., *10-Q Quarterly Report*, filed at the SEC on November 12, 1999.

52 *Id.*, at 6.

Q. PLEASE DESCRIBE THE PUBLIC POLICY GOALS THAT WOULD BE ADVERSELY AFFECTED BY A REQUIREMENT TO PAY RECIPROCAL COMPENSATION ON ISP-BOUND TRAFFIC.

A. Requiring Ameritech Illinois to pay reciprocal compensation on ISP traffic would subvert two major policy goals: (a) creation of incentives for competition in residential local telephone service and (b) creation of incentives for the deployment of advanced services. The State of Illinois and the FCC have clearly indicated the paramount importance of these goals in their decision-making. In this Commission's Final Order in the Ameritech Illinois-SBC merger, the ICC showed its commitment to strengthen the incentives for the deployment of advanced services and promotion of local competition by requiring the merger applicants to commit to significant additional network investment, to ensure availability of ADSL service to residential customers, and to commit to interconnection, OSS, and performance measurement conditions.[53] At the federal level, the FCC clearly stated its public policy goals in its decision approving the Ameritech Illinois-SBC merger:

> "These goals flow from our statutory objectives to open all telecommunications markets to competition, to promote rapid deployment of advanced services, and to ensure that the public has access to efficient, high-quality telecommunications services."[54]

Q. WHY WOULD IMPOSING A RECIPROCAL COMPENSATION PAYMENT SCHEME ON ISP TRAFFIC BE POOR PUBLIC POLICY?

A. Imposing a "reciprocal compensation" type of payment scheme on ISP traffic would be a mandated subsidy to CLECs and ISPs, and poor public policy. For example, payment of a usage-based "reciprocal compensation" charge on ISP traffic would stymie residential

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[53] See Illinois Commerce Commission, *Final Order*, at 17(1)(a)-(1)(b), 30(7)(b), 27(5), 172-3, 195-8, and 220-1.

[54] See FCC, *Memorandum Opinion and Order*, CC Dkt. No. 98-141, at ¶ 355.

local competition. Economic theory suggests that competitors will serve customers where the competitors can make a profit, and will do so in the order of the customers' profitability, i.e., competitors will serve the most profitable customers first. They will choose not to serve customers from whom they cannot make a profit. If this Commission requires the payment of reciprocal compensation for ISP traffic, it will do two things: (1) make ISPs the most attractive local customers that a CLEC could serve, and (2) make residential customers anathema for any CLEC.

Q. WHY IS THAT SO?

A. If the Commission were to impose a reciprocal compensation requirement on ISP traffic, serving ISPs would likely be much more profitable than serving residential customers. In particular, reciprocal compensation turns ISP subscribers from being the most likely profitable local customers (because of their probable socioeconomic status) to being the least desirable customers.

By serving a residential customer, a CLEC will forego the reciprocal compensation payments it would get if it instead served an ISP, and worse, the company will subject itself to paying reciprocal compensation to its competitor who serves the ISP selected by its residential customer. For that reason, I would suspect that the majority of Ameritech Illinois' traffic directed to Focal is ultimately routed to ISPs, and would also suspect that Focal serves few residential customers in Illinois.

This can best be shown by example. Suppose an Ameritech Illinois customer were to order a second line to use the Internet for 1 hour each day, and that she is the customer of an ISP served by Focal. Using an average reciprocal compensation rate of 0.5175¢, under reciprocal compensation Ameritech Illinois would be required to pay Focal $9.32

per month for the privilege of delivering the ISP traffic to Focal.[55] Now, if a CLEC other than Focal were to decide to compete in local telephony, and offer basic local service to this customer, the firm could expect to obtain revenues of $14.35 per month per user.[56] Netting out the reciprocal compensation due, the CLEC would have net revenues of only $5.03 per month, which would probably be insufficient to cover the costs of local voice service such as the local loop, switch port fixed costs, call origination costs, and shared, common and overhead costs.

The reciprocal compensation payments that would be owed to Focal represent a real cost to this CLEC for serving basic local customers that are ISP subscribers. Moreover, this analysis does not even consider the fact that, by offering this customer local voice telephony, the CLEC is exposing itself to the liability of having to pay Ameritech Illinois reciprocal compensation should the customer switch to an ISP that is served by Ameritech Illinois. In this way, reciprocal compensation payments on Internet traffic turn the most desirable residential customers into liabilities.

Q. COULD YOU PROVIDE AN EXAMPLE OF DIFFERENT TYPES OF INTERNET USERS AND THEIR EFFECTS ON THE PSTN?

A. Yes. Table 2 below illustrates the differential effect of reciprocal compensation over some stylized classes of PSTN end users that are also customers of an ISP served by a CLEC:

[55] 60 min/day x 30 days x $.005175 = $9.32. This reciprocal compensation rate is rate being advocated for by Focal. See Verified Statement of John Barnicle at 4.

[56] This revenue amount includes the charge for local dialtone, touch-tone dialing, the federal and state end user common line (EUCL) charges and the intrastate presubscribed interexchange carrier (PICC) charge for non-primary lines. Also, this revenue amount includes per-call revenues of $1.23 per month (calculated as 30 calls x 4.1¢ = $1.23.

Table 2: Effect of Reciprocal Compensation - "ISP-Type" Customers

	Typical Home User (ISP calls from network A to network B)	Telecommuter (8 hr/day ISP calls from network A to network B)	Consultant (Leaves computer connected to ISP 24-7)
Monthly Usage	1800 MOUs[57]	9,600 MOUs[58]	40,320 MOUs[59]
Reciprocal Compensation Rate	0.5175 ¢ / MOU[60]	0.5175 ¢ / MOU	0.5175 ¢ / MOU
Monthly Charge	$14.35[61]	$13.94[62]	$14.35[63]
Payment to Network B	$9.32	$49.68	$208.66
Net Revenue to Network A	$5.03	($35.74)	($194.31)

As can be clearly seen above, in the case of the average online user, Network A ends up turning over almost two-thirds of its revenue to Network B. In the case of the telecommuter, Network A is forced to pay Network B three and a half times what it receives from its own end-user, suffering a loss before considering the costs of provisioning that customer's line. In the extreme case of the consultant, Network A is required to pay to Network B almost fifteen times the revenue generated from its subscriber.

These examples highlight the public policy problem introduced by reciprocal compensation for ISP traffic. Heavy ISP users can cause Network A to pay more in reciprocal compensation to Network B than what it receives from the end-user. It could therefore be said that reciprocal compensation forces Network A to subsidize Network B,

[57] 60 min x 30 days
[58] 8hrs x 5 days/week x 4 weeks; ignores weekend and recreational usage.
[59] 24 hours/day x 7 days x 4 weeks.
[60] See Verified Statement of John Barnicle at 4.
[61] Includes $13.12 for access and $1.23 for 30 calls (30 calls x 4.1¢ per call)
[62] Includes $13.12 for access and $0.82 for 20 calls each month.
[63] Includes $13.12 for access and $1.23 for 30 calls (assuming ISP terminates the call by hanging up the line at least once a day).

as the addition of an ISP customer to Network A causes it to suffer a net loss and to make a substantial payment to Network B for traffic that is generated by Network B's relationship with Network A's customer.

Although the examples above are stylized, they show how subscribers can quickly switch from being assets to liabilities when Internet usage is growing exponentially. Within this rate structure, it is unlikely that an ISP/CLEC would want to migrate work-at-home customers to DSL lines and forego the reciprocal compensation payments. Quite to the contrary, the CLEC's employees would have a perverse incentive to order up Ameritech Illinois lines, connect these to modems, and then dial the ISP, keeping the lines open 24/7, in order to maximize the flow of reciprocal compensation to the CLEC. Surely, the outcome of this perverse incentive cannot constitute sound public policy.

The critique of these examples presented by Focal witness Starkey is flawed.[64] First, these calculations do not utilize Ameritech cost estimates. Therefore, even if Ameritech cost estimates were wrong, as Starkey merely alleges but does not substantiate, my analysis still stands. Second, my analysis includes the per message revenue generated by ISP traffic from residential users. Starkey's argument that Ameritech can recover its costs through per minute local usage rates is disingenuous.[65] Residential customers will rationally seek to minimize their call charges, and will therefore select an ISP that can be accessed via a number that incurs only the per message rate, and not a per minute rate.

Third, Starkey's claim that Ameritech ignores second line revenues is plain wrong.[66] My example are based on second-line rates, and therefore the higher second line end-user line

[64] See Starkey Verified Statement at pp. 36-39.
[65] See Starkey Verified Statement at p. 39.
[66] See Starkey Verified Statement at pp. 40, 47.

charge (EUCL). Starkey does omit to mention that second lines used for Internet access are likely to generate less revenue than primary lines as users are less likely to buy features for a second line (such as call waiting or caller ID), and because second lines generate little if any switched access revenues (because users are more likely to use their primary lines to make and receive long distance calls).

Q. IS PER-CALL PRICING OF LOCAL SERVICE COMPATIBLE WITH RECIPROCAL COMPENSATION ON ISP TRAFFIC?

A. No. The economics underlying reciprocal compensation and ISP traffic must be viewed in conjunction with the current regulations on local telephone companies and basic local service charges for local customers. In Illinois, residential customers pay a 4.1¢ charge for each call dialed to numbers in ranges considered to be within a "local calling area," regardless of call duration.

Reciprocal compensation is compatible with the Illinois pricing scheme only in the case that calls' average duration remains stable across time. Reciprocal compensation is not compatible with such per-call pricing if call duration sharply increases. Under per-call pricing, the ILEC does not receive incremental revenue when an end-user doubles the length of her calls. As ILEC rate regulation prevents the ILEC from raising its rates to cover the additional usage, there can be no additional revenue to share with the interconnected CLEC. In this case both the ILEC and the interconnected CLEC should bear their own cost. When traffic direction is asymmetrical, an ILEC under rate regulation may be required to pay to the interconnected CLEC a disproportionate amount of the revenue it receives from each customer, as the ILEC cannot raise its per-call rates to cover the increased payments for delivery of traffic.

As shown in the statement of Ameritech Illinois witness Eric Panfil, Ameritech Illinois' total residential minutes of use ("MOUs") per month have increased by over 1.5 billion MOUs between March 1997 and October 1999, an increase of over 40%. Virtually 100% of this enormous increase in residential consumption is attributable to the explosive growth in Internet usage by households, since non-Internet MOUs only grew by 2.3% between March 1997 and October 1999. In the same period, traffic from Ameritech Illinois' residential lines directed towards ISPs has grown by over 470%. In fact, of the total growth in minutes during this time period, over 95% of additional minutes were Internet access minutes. The bulk (over 80%) of this growth is generated by residential subscribers rather than business subscribers—and not by all residential subscribers. Approximately 25% of residential subscribers generated this growth in MOUs, with 5% of residential subscribers generating 67% of the growth in MOUs.

Q. HOW DO RECIPROCAL COMPENSATION PAYMENTS ON ISP-BOUND TRAFFIC CREATE DISINCENTIVES FOR THE DEPLOYMENT OF ADVANCED SERVICES?

A. From the perspective of the CLEC, there is a disincentive in deploying advanced services such as ADSL or cable modems because these forms of access will decrease the amount of reciprocal compensation payments the CLEC receives. For example, suppose a CLEC is considering whether to deploy ADSL to serve businesses and residences. The CLEC would gain the revenues paid by business and residential customers for the ADSL service, less the costs of providing that service. In addition, to the extent that these customers previously accessed the Internet via dial-up modem to an ISP served by the CLEC, the CLEC would have to forego this reciprocal compensation revenue.

Alternatively, suppose a new access technology were to be developed that is more efficient than dial-up ISP service, but it is not subsidized by reciprocal compensation. CLECs and ISPs would have financial incentives not to adopt this new technology, although it is more efficient, in order to keep the reciprocal compensation subsidy flowing. Indeed, the sole incentive for the CLEC in such a case is to minimize costs of transport and delivery to the ISP, with complete disregard for the costs imposed on the ILEC's network and ratepayers.

Thus, a policy of reciprocal compensation on ISP traffic creates additional opportunity costs to CLECs for deploying advanced services such as ADSL. From the perspective of the end-user (especially high-volume, high-download users), there is a disincentive to change from dial-up access to broadband technologies such as ADSL. The disincentive is caused by the reciprocal compensation subsidy. Because the end-users of dial-up access do not have to pay for all of the costs they incur on the telephone network, these users have an incentive to stay on the dial-up technology. If they were to switch to a broadband technology, then these users would have to pay for the costs that they incur on that network. In the case of broadband, there is no reciprocal compensation subsidy.

Such a result surely cannot be desirable from a public policy or economic perspective. Indeed, it is crucial to note that under Focal's proposal, there is an absolute loss in efficiency, without any compensating social or public policy benefit, and therefore the proposal is ultimately unsustainable. Imposing a reciprocal compensation scheme on ISP traffic would create a less competitive market, with the consequent inefficiencies, while serving only to subsidize CLECs and ISPs. First, CLECs would be likely to compete with each other by lowering charges to their ISP customers or by offering other forms of

rebates, for example, a share of the reciprocal compensation payments received by the CLEC. ISPs (and by extension, the customers of the ISP) would therefore have distorted economic incentives as to the consumption of dial-up connectivity. Indeed, an ISP might even encourage its customers to keep their lines permanently "nailed up." Second, Ameritech Illinois would be severely disadvantaged when competing for the custom of ISPs. Unlike the CLECs, it would neither be able to count on reciprocal compensation payments (as the vast majority of dial-up will likely continue to be located on the Ameritech Illinois network), nor could it match the below-cost rates offered by CLECs (as this may be prohibited by applicable state and federal regulations). Certainly, the ratepayers of Illinois would not be well served by such a policy.

Q. HOW SHOULD THIS COMMISSION IMPLEMENT AMERITECH ILLINOIS' PROPOSAL ON THE TREATMENT OF ISP-BOUND TRAFFIC?

A. I believe that Ameritech Illinois' proposal of denying Focal's request that reciprocal compensation extend to ISP traffic reflects both sound public policy and common sense.

In case this Commission decides that such a denial cannot be implemented at once, an approach of phasing out reciprocal compensation on ISP traffic would represent a viable alternative. A phase-out approach would be less desirable on economic and public policy grounds, as it would continue the implicit subsidy and economic distortion, albeit in reduced form. The phasing-out of such payments, however, would allow companies to change their business models and make necessary changes in agreements and contracts they have with customers.

A phase-out decision would follow past approaches to the restructuring of interconnection rates. One such example is the restructuring of interstate switched access

and transport rates, with the introduction of the carrier common line charge (CCL) and the residual interconnection charge (RIC), that were subsequently phased out once they were no longer necessary.

A phase-out approach could also include a cap on the amount of reciprocal compensation paid for any one call, capping the amount at a fixed percentage of the per call revenue derived from retail customers. Application of such a cap will greatly reduce many of the incentives CLECs and ISPs have to arbitrage the reciprocal compensation payment scheme.

III. SUMMARY & CONCLUSIONS

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND OPINIONS.

A. First, public policy analysis indicates that Ameritech Illinois should not be required to pay reciprocal compensation on ISP traffic. This Commission should therefore deny Focal's request to extend reciprocal compensation to ISP traffic.

Second, it would be inefficient to apply the current structure of reciprocal compensation rates to ISP traffic, and that such an application would lead to cost over-recovery on the part of the CLEC serving the ISP. Consequently, reciprocal compensation should not apply to ISP-bound traffic. Also, if this Commission decides to address Issue 2, it can do so by requiring parties to abide by forthcoming FCC rulings regarding reciprocal compensation payments on ISP traffic.

Finally, if the Commission decides that a denial of payment of reciprocal compensation is not currently possible, then a cap on the amount of reciprocal compensation paid per

subscriber could mitigate some of the negative public policy and distortions of economic efficiency outlined in this verified statement.

Q. DOES THIS CONCLUDE YOUR STATEMENT?

A. Yes, it does.

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46) "Economics of Traffic Density in the Rail Freight Industry," *Bell Journal of Economics* 8(2), Autumn 1977.

PAPERS, REPORTS, PRESENTATIONS & PROFESSIONAL PROCEEDINGS

1) "Telecommunications Trade and Investment Opportunities in China and India," presented to the Massachusetts Telecommunications Council, Boston, February 1995.

2) "The Strategic Implications of Interactive Broadband Telecommunications Networks for Competition and Public Policy," presented to the National Communications Forum, Chicago, September 1994.

3) "Competitive Implications of Vertical Relations between Equipment Vendors and Telecommunications Services: Lessons from the French Experience," with Joanne Oxley, presented to European Regional Conference of the International Telecommunications Society, Stenungsbaden, Sweden, June 21, 1993.

4) "Obtaining Competitive Intelligence and Creating Competitive Advantage through the Public Policy Process," with Steven Harris, invited paper, Annual Conference of the Society for Competitive Intelligence Professionals, Los Angeles, April 2, 1993.

5) "Deployment and Adoption of Integrated Services Digital Network in the U.S.: Progress and Public Policy Obstacles," with Luis Enriquez, invited paper, Twenty-Fourth Annual Conference, Michigan State University Institute of Public Utilities, Williamsburg, Virginia, December 8, 1992.

6) "Market Definition and Market Power in the Sports and Entertainment Industry," invited presentation, Antitrust Section, American Bar Association Annual Proceedings, San Francisco, August 1992.

7) "The Design of Incentive Regulation for Telecommunications," invited presentation, Conference on Alternative Regulation, Illinois Commerce Commission, Chicago, July 1992.

8) "The Effects of Public Policies on ISDN Deployment and Adoption in the U.S.," presented to International Telecommunications Society, Cannes, France, June 1992.

9) "Removing the MFJ Restriction on InterLATA Services," invited testimony, Subcommittee on Telecommunications & Finance, U.S. House of Representatives, Washington D.C., May 1992.

10) "The Implications of Telecommunications Infrastructure Investment for R&D, Innovation and Competitiveness," invited testimony, Subcommittee on Communications, U.S. Senate, Washington D.C., February 1992.

11) "Principles of Costing and Pricing for Telecommunications Regulatory Policy," invited testimony, Colorado Public Utilities Commission En Banc Hearing, Denver, February 1992.

12) "Deregulation and Interstate Bank Entry in California," with Lee Burke, Research Report of the California Policy Seminar, UC Berkeley, April 1991.

13) "Assessing the Future of Telecommunications in the Global Economy," invited address, California Telephone Association, Monterey, CA, February 1991.

14) "Economic Rationale for a National Fiber Optic Infrastructure," invited address, Congressional Staff Forum on Telecommunications (sponsored by Ameritech), Washington D.C., February 1991.

15) "Applications of Incentive Regulation: An International Comparison," invited presentation, Conference of California Public Utilities Counsel, Long Beach, CA, October 1990.

16) "The Role of Telecommunications in Regional Economic Development," invited address, Rocky Mountain State Leaders Conference, Billings, Montana, October 1990.

17) "Telecommunications and Public Policies in the Global Market," invited address, Carnegie Council, New York, NY, October 1990.

18) "Why We Need a National Telecommunications Policy: A Comparative Perspective," invited address, Policy Issues Management Conference, Bell Communications Research, Murray Hill, NJ, October 1990.

19) "Incentive Regulation for Telephone Utilities," invited presentation, Workshop of the Colorado Public Utilities Commission, Denver, September 1990.

20) "The Role of Telecommunications Policy," invited lecture, Conference on Economic Development in the Pacific Northwest, Portland, Oregon, September 1990.

21) "The Changing Economics of Telecommunications: Implications for U.S. Policy and Competitiveness," invited briefing of U.S. Congressional staff on telecommunications (sponsored by Pacific Telesis), San Francisco, August 1990.

22) "Communications Competitiveness and Infrastructure Modernization Act of 1990," invited testimony, Communications Subcommittee, U. S. Senate, Washington D.C., July 1990.

23) "Investing in America's Future," invited essay, 1989 Annual Report of Southwestern Bell Corporation, St. Louis, 1990.

24) "The Public Switched Telephone Network and Rural Economic Development," invited lecture, Montana State Leaders' Conference, Helena, April 1990.

25) "Is Public Policy Meeting the Needs of Consumers?" invited panelist, Conference on Telecommunications Technologies and Policies, Center for Communications and Information Science & Policy, University of Pennsylvania, March 1990.

26) "Telecommunications as a Strategic Industry," invited address, New England Council, Boston, February 1990.

27) "Fiber to the Customer: A Public Policy Perspective," invited paper, Western Communications Forum, San Diego, February 1990.

28) Session Chair and Moderator, "State Regulatory Reform: Recent and Future Trends," Fifth Conference on State Telecommunications Regulation, University of Utah, Salt Lake City, January 1990.

29) Invited Panelist, "Crossroads of Information Technology," Board on Telecommunications and Computer Applications, National Academy of Engineering, Washington D.C., October 1989.

30) Invited Panelist, "Industry Forum," Annual Meeting of the U.S. Telephone Association, San Francisco, October 1989.

31) "Strategic Lessons from Deregulated Industries," paper presented to Strategic Management Society, San Francisco, October 1989.

32) "Deregulation in the Transportation Industries: Lessons for Telecommunications Managers," invited paper, Center for Telecommunications Management, University of Southern California, October 1989.

33) "Price Cap Regulation and Economic Forecasting," invited presentation to 1989 National Forecasting Conference, Bell Communications Research, San Francisco, May 1989.

34) "The Strategic Implications of Telecommunications Deregulation in Europe," invited presentation, Strategic Management Society, Amsterdam, October 1988.

35) "Telecommunications Deregulation: Implications for the California Economy," invited presentation, California Foundation for the Environment and the Economy, Carmel, June 1988.

36) "A Comparison of U.S. and Japanese Policies toward Information Technologies," invited presentation, International Public Economics Association, Tokyo, May 1988.

37) "Information Technologies, Public Policy, and Regional Economic Development," invited address, Conference on Regional Development in Japan, Hokkaido University, Sapporo, Japan, May 1988.

38) "The Implications of Line-of-Business Regulation for Diversification Strategy & Enterprise Structure," presented to Strategic Management Society, Boston, October 1987.

39) "Alternative Regulatory Frameworks for Local Exchange Carriers," invited presentation, En Banc Hearing of the California Public Utility Commission, September 1987.

40) "Emerging Telecommunications Policies in Europe," Briefing of California Legislative Leaders, Los Angeles, September 1987.

41) "Japanese Corporate Philanthropy in the United States," presented to Academy of Management, New Orleans, August 1987; Center for Research in Management Working Paper BPP-23; published in summary form in *Strategic Directions*, with Barbara Lombardo and David Vogel, April 1989.

42) "The Effects of Deregulation on Competition and Competition Policy in Banking: A Review of the Literature," Working Paper No. 4, National Center for Financial Services, Berkeley, August 1987.

43) "Competitive Strategies under Regulatory Constraint: Implications of the AT&T Divestiture on Vertical Relations in Telecommunications," with David J. Teece, paper presented to Strategic Management Society, Singapore, 1986.

44) "The Economic Consequences of Deregulation," invited address, Emerging Issues Program, Conference of National State Legislative Leaders, Los Angeles, September 1986.

45) "Public Policies toward Utility Diversification: An Overview," invited presentation, California Policy Seminar/California Senate Office of Research, Berkeley, April 1986.

46) "New Technologies for Local Loop Access: An Economic and Regulatory Analysis," with Gary Pisano, Office of Technology Assessment, United States Congress, June 1985.

47) "Corporate Community Involvement in the Greater San Francisco Bay Area," with D. Vogel and J. Logsdon, Center for Research in Management, working paper, Berkeley, May 1985.

48) "The Future of Telecommunications Regulation," invited presentation, En Banc Hearing of the California Public Utilities Commission, San Francisco, November 1984.

49) "Testimony in Support of the Taxpayer Antitrust Enforcement Act," Judiciary Committee, U.S. Senate, May 1984.

ADMINISTRATIVE POSITIONS, UNIVERSITY OF CALIFORNIA

WALTER A. HAAS SCHOOL OF BUSINESS

Chair, Business and Public Policy Group (1983-84, 1986-93).
Policy and Planning Committee (1986-88; 1991-93); Chair (1987-88; 1992-93).
Chair, Program in Business and Social Policy (1986-90).
Business School Building Program Committee (1986-91).
Ph.D. Field Advisor, Business and Public Policy (1981-87; 1989-91).
Policy and Planning Committee (1991-3; Chair, 1992-93).
Member, Board of Directors, Washington Campus Program (1990-93).
Director, The Executive Program (1983-85).
Director, Executive Programs in Telecommunications (1989-92)
Chair, Executive Education Task Force (1991-93).
Member, Board of Directors, Berkeley Center for Executive Development.

UNIVERSITY OF CALIFORNIA, BERKELEY

Executive Committee, Center for Research in Management (1989-).
Advisory Board, Lester Center for Innovation and Entrepreneurship (1992-).
Chancellor's Advisory Committee on Parking (1988-89).
Executive Committee, National Financial Services Center (1986-88).
Executive Committee, Institute of Transportation Studies (1981-83).
Director, Center for Transportation Policy Research (1980-82).

UNIVERSITY OF CALIFORNIA, SYSTEMWIDE

Working Group on Technology Transfer (1988-90).
Task Force on Telecommunications and Information Policy Research (1984-85).

PROFESSIONAL AFFILIATIONS

American Economic Association

Academy of Management

Strategic Management Society

International Telecommunications Society

Association of Public Policy Analysis and Management

SERVICE TO PROFESSIONAL JOURNALS, SOCIETIES & PUBLIC AGENCIES

Governor's Ad Hoc Committee, Golden State Quality Awards (1991-92)

Chair, Ninth Annual International Conference of the Strategic Management Society, San Francisco (1989)

Associate Editor, *California Management Review*

Associate Editor, Logistics and Transportation Review

Editorial Advisory Board, Transportation Research

Session Organizer, Telecommunications Policy Research Conference (1988, 1989)

Session Organizer, Academy of Management (1991)

Reviewer/Referee: *Bell/RAND Journal of Economics; Industrial and Corporate Change; Journal of Asian Economics; Journal of Economics and Business; Journal of Public Policy Analysis & Management; Journal of Regulatory Economics; National Science Foundation; Quarterly Review of Economics and Business; Review of Economics and Statistics; Telecommunications Policy.*

CONSULTING & TESTIMONY

ECONOMIC CONSULTING TO PUBLIC AGENCIES

California Department of Consumer Affairs (industry analysis; telecommunications policy); California Office of Attorney General (antitrust analysis in tire industry, merger analysis in food retailing industry, resale price maintenance in consumer electronics, infant formula pricing); California Public Utilities Commission (teach regulatory economics & policy to Commission staff); Interstate Commerce Commission (rate regulatory policy, merger policy, costing methodology); Office of Technology Assessment (telecommunications policy); U.S. Department of Transportation (railroad industry rationalization, merger policy); U.S. General Accounting Office (transportation policy).

REGULATORY EXPERT TESTIMONY

Pacific Bell (product pricing, competitive strategy, regulatory policy, broadband deployment, MFJ interLATA relief); US WEST (regulatory policy, costing and pricing principles, local competition and interconnection); Ameritech (price regulation; local competition policy); General Telephone (pricing, regulatory policy);

Western Coal Traffic League (railroad pricing); Consolidated Freightways (motor carrier pricing); Southern Pacific Transportation Co. (route rationalization analysis; rail merger analysis; pricing of trackage rights); American Presidents Intermodal Co. (competition policy, merger analysis); Bell Communications Research (R&D policy analysis); Bell Atlantic (price regulation, cable rate regulation; cellular telephone joint venture); Southwestern Bell (price regulation, local competition policy); BellSouth (price regulation, local competition policy); NYNEX (FCC spectrum auction rules); United States Telephone Association (FCC price regulation); MFJ Task Force (MFJ manufacturing relief); AGT and Stentor Companies (Canadian interconnection and local competition policy); Iusacell (Mexican interconnection and local competition policy).

BUSINESS LITIGATION EXPERT WITNESS TESTIMONY

Electrical contracting; biotechnology manufacturing equipment; corrugated steel pipe products; pipe fabrication; vision care services; electronic lighting ballasts; motion picture production, distribution and exhibition; regional shopping center development; semiconductor manufacturing equipment; digital-analog converters; workmen's compensation insurance; semiconductor manufacturing; resale of telecommunications equipment and services; after-market servicing of telecommunications equipment; on-line information and transaction services; magazine publishing; telecommunications equipment; Internet services; citric acid.

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